Air Force Research Laboratory | AFRL

Science and Technology for Tomorrow's Aerospace Forces

Success Story

DEVELOPMENT OF A REFERENCE DOSE FOR AMMONIUM PERCHLORATE

Appropriate toxicological studies are critical to the establishment of scientifically based standards for remediation of perchlorate, a chemical that prevents iodine uptake of the thyroid gland. This research will lead to a formal peer-reviewed process to establish regulatory standards for perchlorate. Currently, recommended action levels are low, provisional, and based on limited analytical detection capability and incomplete data. This standard will protect human health without undue restrictions and could reduce clean-up costs substantially.

Air Force Research Laboratory
Wright-Patterson AFB OH

Accomplishment

The Interagency Perchlorate Steering Committee (IPSC) is a partnership between state and Environmental Protection Agency (EPA) regulators, industry, and the Air Force. The IPSC serves as a single toxicology point of contact for customers, regulators, and media on multiple, independently completed toxicology research efforts. This committee ensures the maximum efficiency of resources and optimal solutions in a timely manner.

The participation of the Human Effectiveness Directorate's Operational Toxicology Branch in the IPSC ensures that research conducted provides risk managers (Air Force/insulation and logistics and base environmental managers) with the necessary data to make health-based decisions. Final regulatory decisions affect Air Force personnel, the public, and the disposition of Air Force property and contracts.

The directorate's in-house toxicology research and collaborations generate critical toxicity information that fills substantial data gaps concerning the effect of perchlorate on the thyroid gland. The directorate's research led to a draft assessment document in 14 months versus the traditional 10-12 years.

Background

The US Government specifies the use of ammonium perchlorate (AP) powder as an oxidizer in most solid rocket motors. AP's high solubility in water results in a long-lived perchlorate ion that competes with iodine, resulting in an iodine-deficient thyroid or goiter.

EPA regulators discovered AP-contaminated drinking water sources in California and Nevada and in groundwater in Utah, Arizona, Texas, Maryland, Arkansas, Florida, West Virginia, and at Holoman AFB in New Mexico. The IPSC partnership is providing the best decisions to minimize duplication of effort while informing the public of perchlorate-related events. The directorate and industry are addressing the significant data gaps identified by the first draft assessment.

Human Effectiveness
Emerging Technology

Additional information

To receive more information about this or other activities in the Air Force Research Laboratory, contact TECH CONNECT, AFRL/XPTT, (800) 203-6451 and you will be directed to the appropriate laboratory expert. (00-HE-03)